



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/987,920 | 11/16/2001 | Yoshihiro Izumi | 1035-352 | 7938: |

7590 08/05/2003
NIXON & VANDERHYE P.C.
8th Floor
1100 North Glebe Rd.
Arlington, VA 22201-4714

EXAMINER

SUNG, CHRISTINE

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2878

DATE MAILED: 08/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/987,920

Applicant(s)

IZUMI, YOSHIHIRO *EW*

Examiner

Christine Sung

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20 is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-19 is/are rejected.
- 7) ☒ Claim(s) 6 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5, 10-12 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Polischuk et al (US Patent 5,880,471).

Regarding claims 1-3, Polischuk discloses a detector comprising:

A semiconductor film (element 16), which generates a charge upon induction by an electromagnetic wave;

an active matrix array for reading out the charge which is generated in the semiconductor film, (element 12);

an active matrix array (see figure 1, element 12) is formed by having a substrate as its base and detects the electromagnetic wave by a direct converting system (See figure 1);

wherein the semiconductor film is mainly Selenium (Column 8, 24-25);

and wherein the semiconductor film is formed as a continuous film to cover a surface of the active matrix array. (see Figure 1)

However, Polischuk does not specify the use of a resin substrate, but rather does not limit or specify the type of substrate to be used (Column 8, lines 26-29). He leaves the type of substrate to be used up to the user for the particular experiment or situation. It is well known in

Art Unit: 2878

the art to use a resin substrate in these types of detectors. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a resin substrate since it has been held to be within the general skill of a working in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Regarding claim 5, Polischuk discloses that the semiconductor material chosen is selenium based, meaning that the material is generally made of selenium along with other pertinent materials. Polischuk does not limit the materials, therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a photoconductive organic material as a main component of the semiconductor material, since it has been held to be within the general skill of a working in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Regarding claims 10 and 11, Polischuk teaches that the semiconductor layers and substrate materials often have large differences in thermal expansion coefficients thereby creating unwanted shear stress during use of the detector. Therefore since the thermal expansion coefficient is a result effective variable, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have tailored the thermal expansion coefficients of the semiconductor and substrate to obtain the proper and workable range for a specified application.

Regarding claim 12, the thickness of the film as claimed is on the order of thickness of conventional substrates as disclosed by Polischuk (Column 9, line 11). Therefore it would have

Art Unit: 2878

been obvious to one having ordinary skill in the art at the time the invention was made to have used the range of thickness as disclosed by the invention for applications where a certain detector thickness must be achieved.

Regarding claims 15 and 16, Polischuk does not limit what type of material the substrate is made from, but rather leaves those specifics open for tailoring to certain applications. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a mixture of organic/inorganic materials for the substrate, since it has been held to be within the general skill of a working in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

3. Claims 8, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Polischuk et al (US Patent 5,880,471) in view of Kuroda (US Patent 6,083,629).

The limitations set forth in claim 1 have been disclosed in the above paragraphs by Polischuk. However, he does not specify the use of a gas barrier layer, or a second resin layer that is flexible. Kuroda discloses a multilayer film with a protective gas barrier layer and a resin layer used to protect the subsequent layers beneath the aforementioned layers. Further he discloses that the resin layer is flexible or stretchable. (column 5, lines 38-45). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included the protective layer or flexible resin layer to protect subsequent layers from moisture or physical damage.

4. Claims 1, 3-4, 14 and 17-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al (US Patent 6,512,233) in view of Polischuk (US Patent 5,880,472).

Regarding claims 1, 3, 14 and 17, Sato et al. discloses a detector comprising:

A semiconductor film (Figure 1, element 5), which generates a charge upon induction by an electromagnetic wave;

an active matrix array for reading out the charge which is generated in the semiconductor film, (Figure 5, element 20);

an active matrix array (see figure 5, element 20) is formed by having a substrate as its base (element 23) and detects the electromagnetic wave by a direct converting system (See figure 5);

wherein the semiconductor film is formed as a continuous film to cover the surface of the matrix array. (see Figure 5);

wherein the semiconductor film is made of CdTe (see abstract).

Sato does not specify the use of a resin substrate, however, Polischuk discloses using any type of substrate suitable for the particular application. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the resin substrate for applications where flexibility and high bonding between layers is a necessary quality.

Regarding claim 4, Sato discloses that the semiconductor film and the matrix array are formed on different substrates, thereafter being joined together (Column 8, line 58- Column 9, line 3).

Art Unit: 2878

Regarding claim 14, Sato discloses a matrix array including a TFT element (Figure 4, element 22), a charge storage capacitance (element 21), a charge collector electrode (element 7); a scanning electrode or driving electrode (element 27) and a data electrode (element 26).

Regarding claim 18, Sato et al further discloses a supporting substrate (element 2), which includes a bias (or common electrode, element 3) and the semiconductor film (element 4).

Regarding claim 19, Sato et al further discloses a conductive connection material (element 14) that connects the matrix substrate and the supporting substrate (see figure 5).

Allowable Subject Matter

5. Claim 20 is allowed.
6. Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. The following is a statement of reasons for the indication of allowable subject matter:

Although many prior art references disclose the use of a curved detector, none of the prior art of record discloses a layered curved detector. Although many references include the use of a curved detector the detector are sectioned and placed in a curved manner.

The claimed invention creates the curvature of the detector in whole layers, unlike the segmented detectors described in the prior art.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2878

- a. US Pre Grant Publication 2002/0418949 A1- this reference discloses using detector with all the elements including a resin substrate but cannot be applied due to its filing date.
 - b. US Patent 6,407,374 B1- this reference discloses a similar invention as the one claimed, but discloses the process of making.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Sung whose telephone number is 703-305-0382. The examiner can normally be reached on Monday- Friday 7-4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 703-308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-0956 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

CS
July 28, 2003


DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800